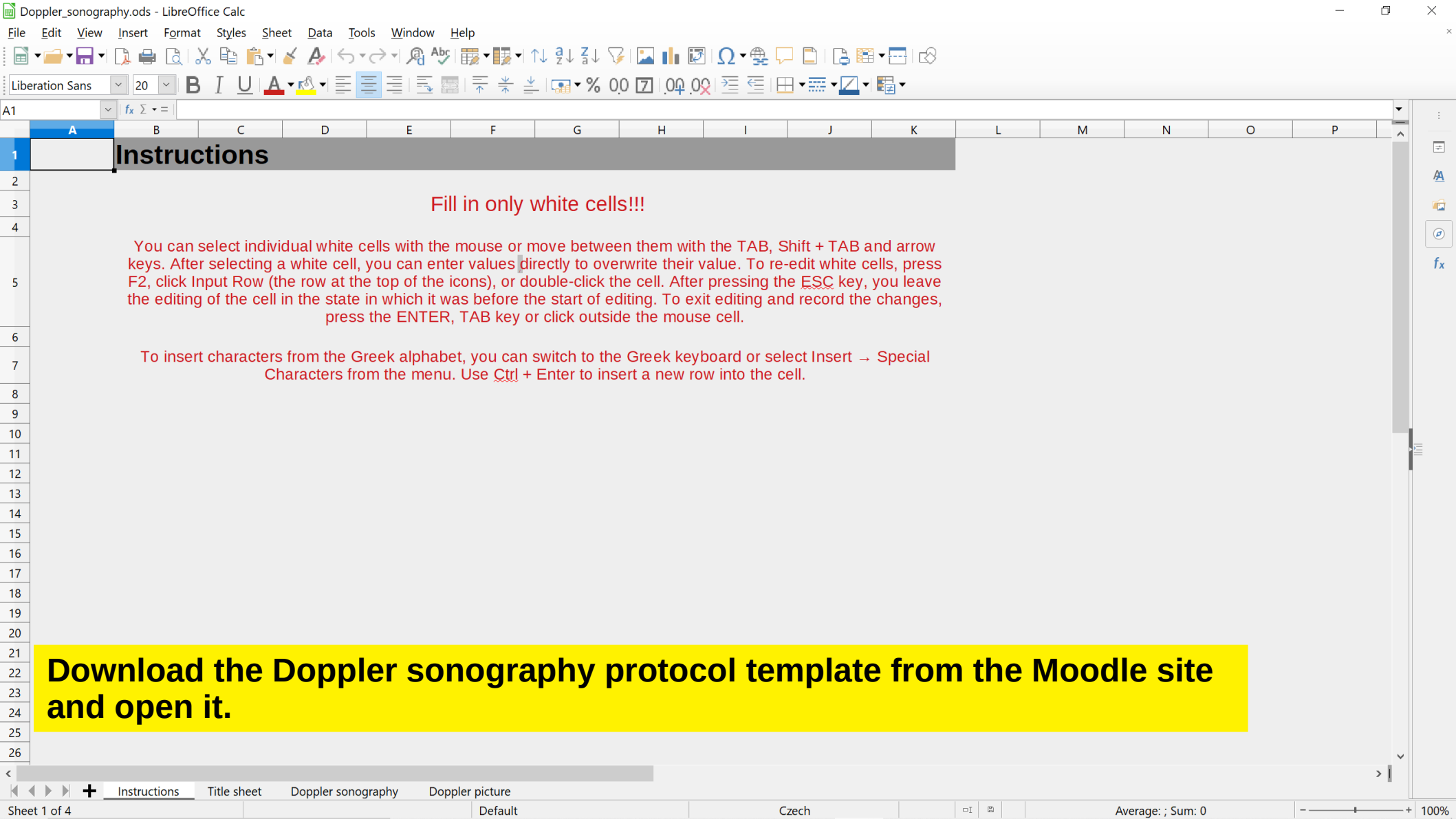




Doppler sonography

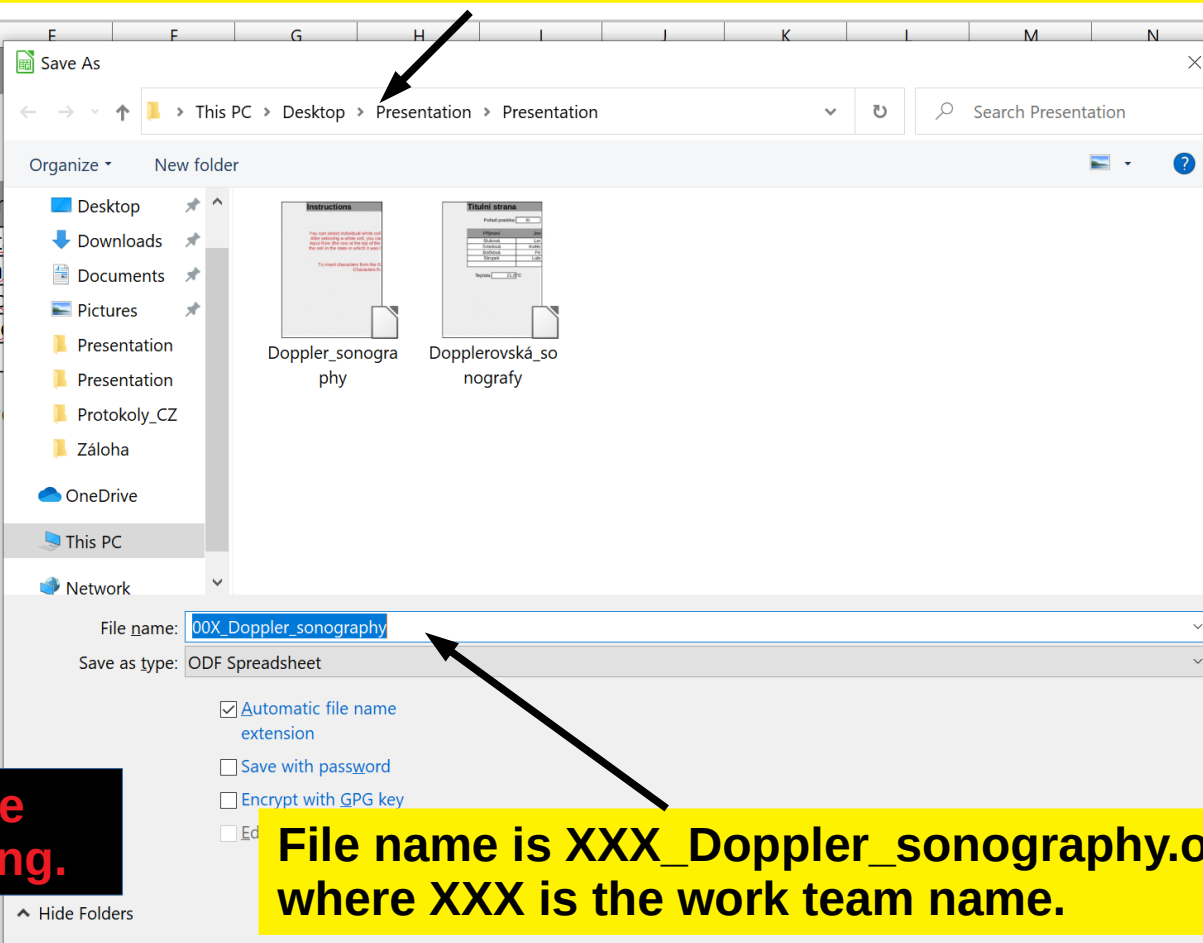


Save the protocol using the "Save" or "Save as" command from the "File" menu after filling in the "Title sheet".

Save the protocol file in the Documents\Practicals_EN\GroupXX folder, where XX is the group number.

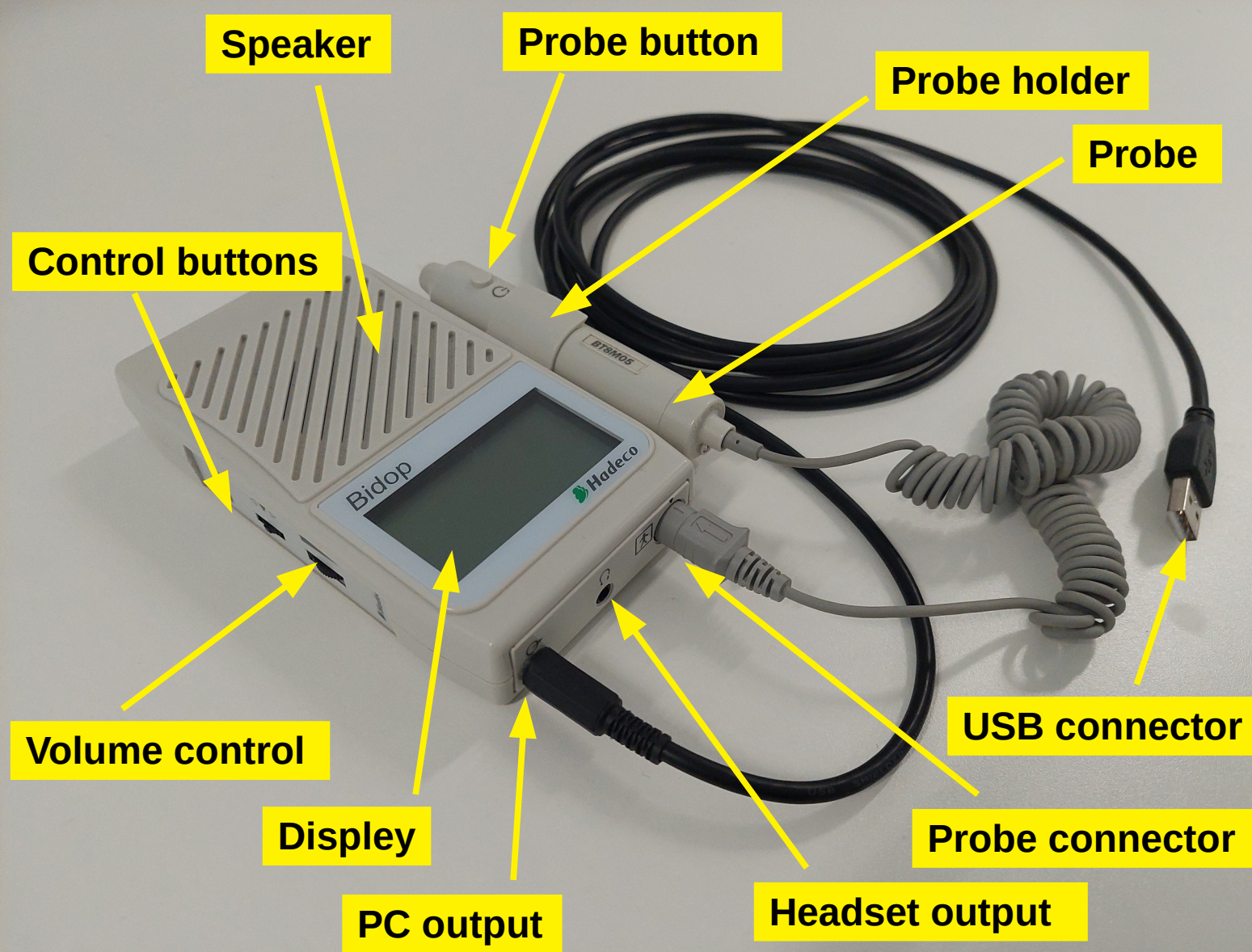
A1

Title sheet	
Order of practice: III.	
Surname	Name
Aguirre	Krist
Tyurin	Mich
Kannika	Boroc
Jakob	Bayl
Temperature: 21,0°	



The program with the protocol leave running.

File name is XXX_Doppler_sonography.ods, where XXX is the work team name.



Switch on the instrument

- Insert the battery into the device.
- Connect the device to the computer using the USB connector.
- Remove the probe from the holder.
- Switch on the instrument using the button on the probe.

Do not touch the control buttons, you can change the settings of the device.



Smart-V-Link
Ver4.1



Click on the Smart-V-Link application icon

Look at the next slide what to do if the program does not start.

It often happens that the Smart-V-Link window has been minimized, which cannot be maximized again. In this case, the program must be closed and restarted. Therefore, do not minimize the Smart-V-Link window during the measurement, you may lose data.

Right-click on the Smart-V-Link program icon in the bottom bar and close the window.

Recent

- TB_doppler
- pokus
- Vit Bezecný
- ab01
- 9A Dubová
- 2A.2A
- 4A
- 4D
- domca
- Aneta Tokosova
- Tereza Mazalovska
- Anhelina
- PalMai

Smart-V-Link Ver4.1

Pin to taskbar

Close window

Patient Information

Save

Return to
Main Screen

First Name:

Last Name:

ID:

Sex:

Date of Birth:

Age:

Height:

Weight:

Telephone Number:

Test Date:

09 / 06 / 2021 (MM/DD/YYYY)

When the Smart-V-Link program starts, a window asking you to fill in the patient data appears.

Facility:

Ústav biofyziky 2. LF UK

Performing Studies:

Requesting Physician:

Patient Information

SaveReturn to
Main Screen**First Name:**

John

Last Name:

Doe

ID:**Sex:**

MALE

Date of Birth:**Age:**

24

Height:

185

cm

Weight:

90

kg

Telephone Number:**Test Date:**

09 / 06 / 2021

(MM/DD/YYYY)

Facility:

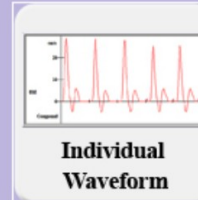
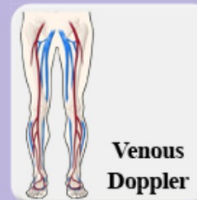
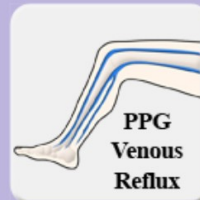
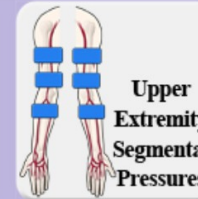
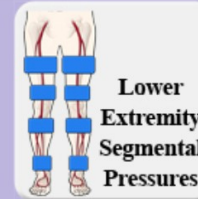
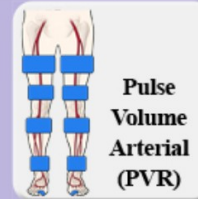
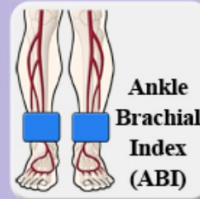
Ústav biofyziky 2. LF UK

Performing Studies:**Requesting Physician:**

Click on the "Save" button after filling in the individual fields.

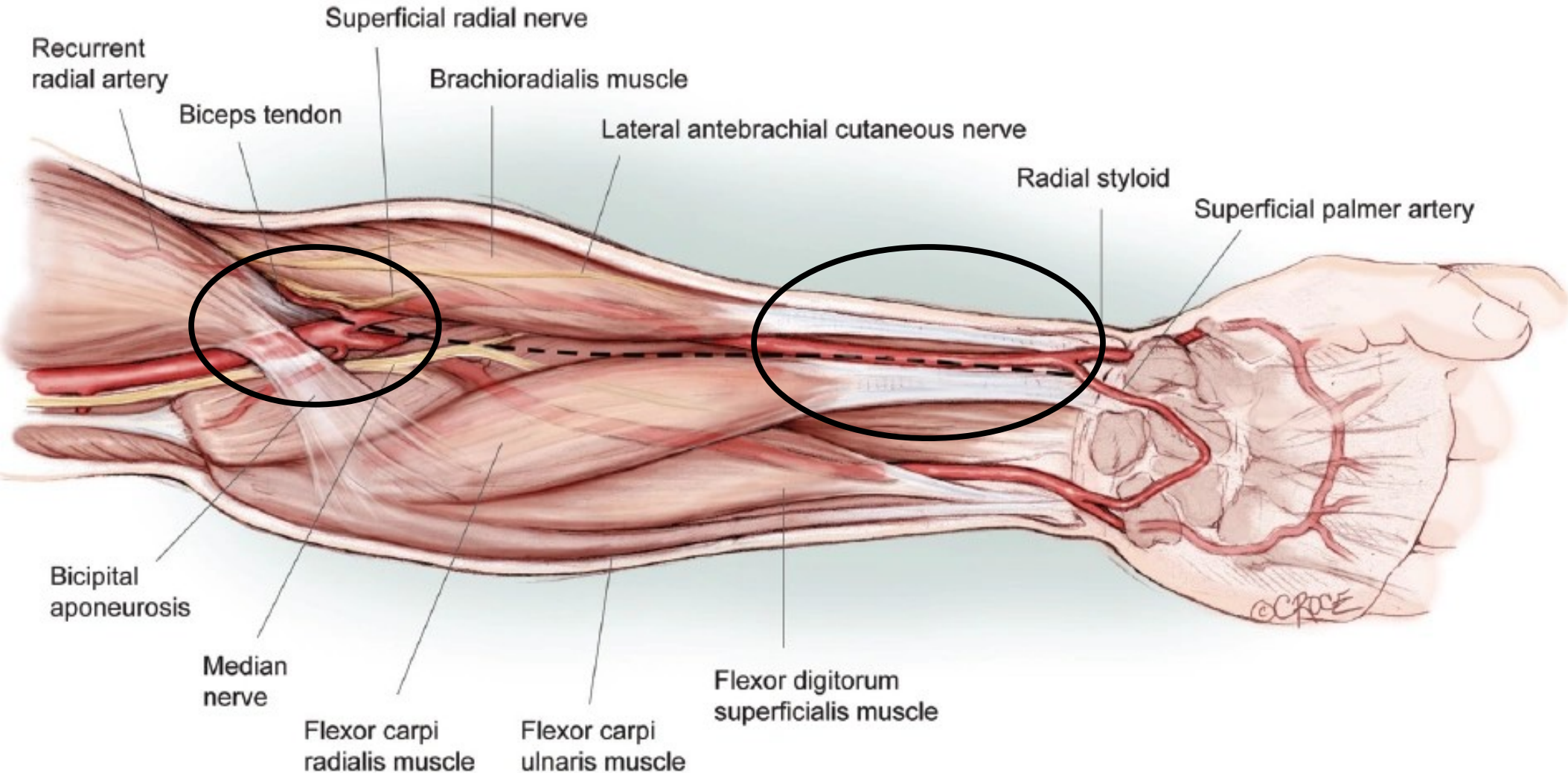
Main Screen

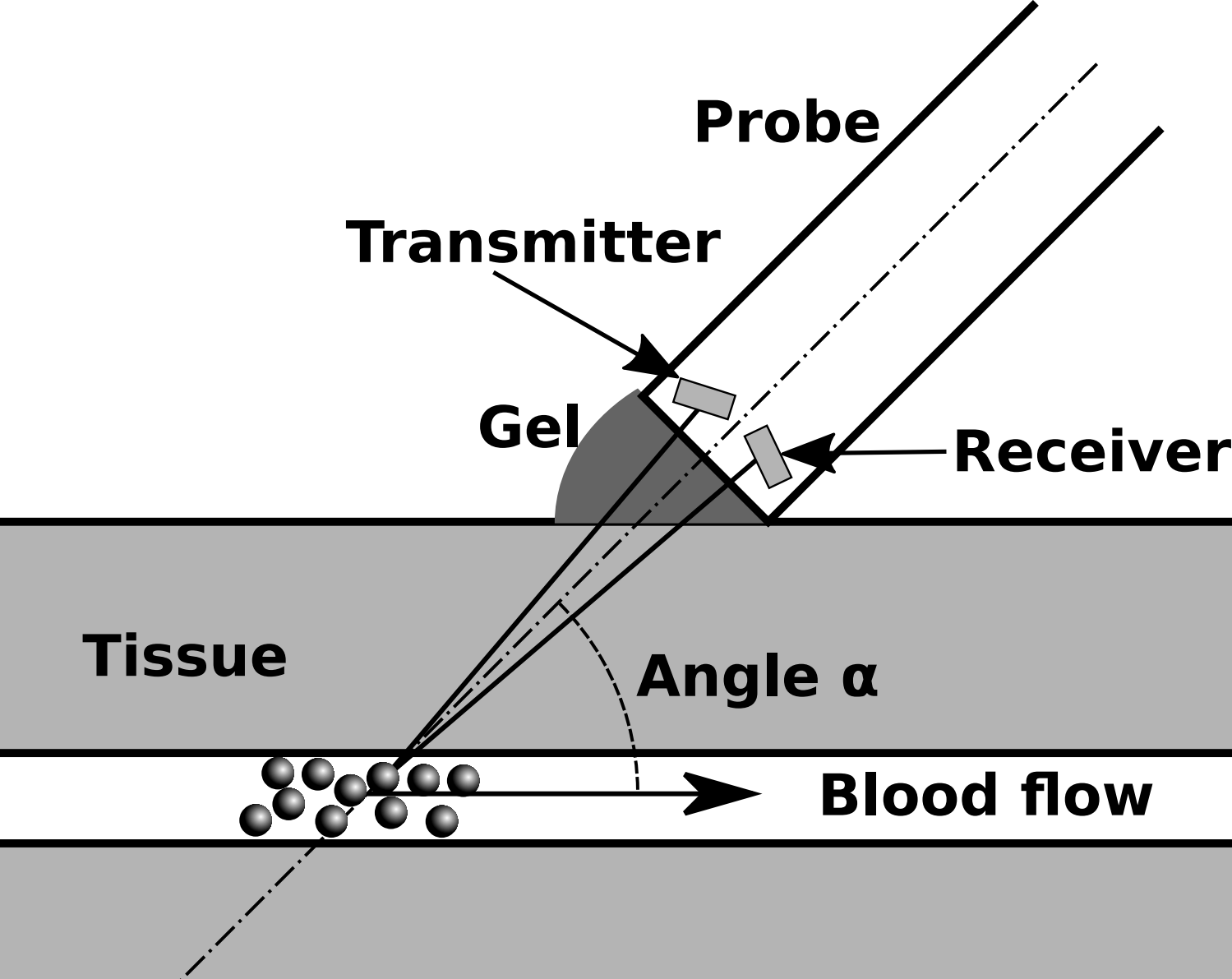
SaveFile	Search Files	New File	Patient Information	Symptoms/ Diagnosis	Print Report
	Download	Site	Default Data	Options	



Select "Individual Waveform" on the main screen .

Measurement of the radial artery in the elbow or wrist

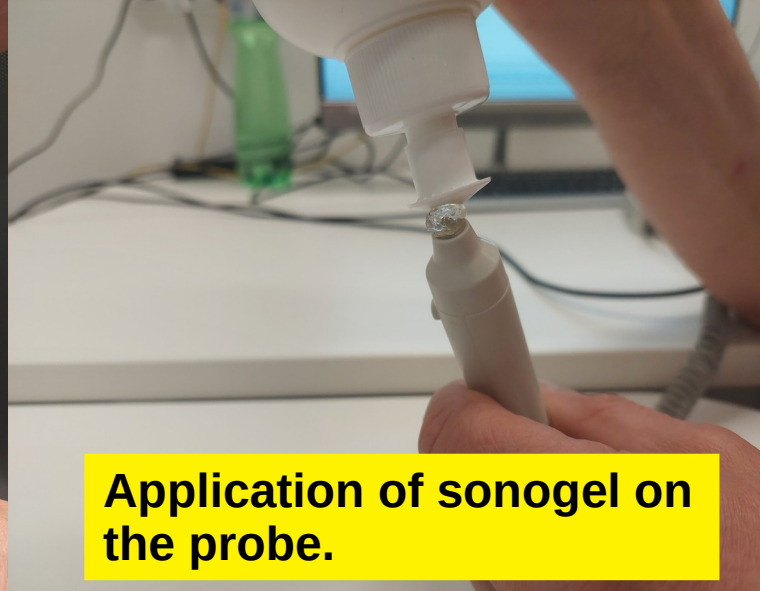




Place the probe at an angle α of approximately 45° to the hand of the examinee against the direction of blood flow. Try to find the radial artery.



Opening and closing the sonogel.



Application of sonogel on the probe.



Applied sonogel on the probe.



Finding the pulse at the measuring place.



Place the probe at the measuring place after finding the pulse.

The sonogel should be shaken before use. Be sure to close the bottle before shaking.

Individual Waveform

Numerical Data

Probe *****

Mode *****

Max ***.* cm/s

Ave. ***.* cm/s

D ***.* cm/s

Min ***.* cm/s

SD **.*

RP **.*

PI **.*

HR *** BPM

Pressure mmHg

Click in the gray box or press the button on the probe to start recording.

Site

Delete

Print

Compound

Separation

Return To
Main Screen

Monitoring Screen

Numerical Data

Probe 8M

Mode Separation

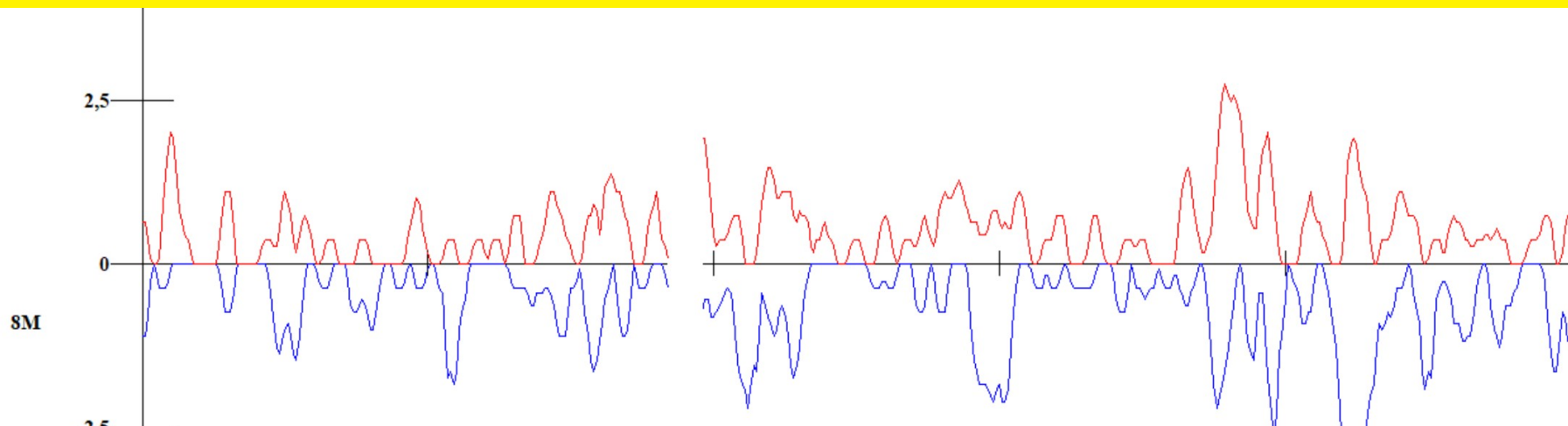
Max *****cm/s

Ave. *****cm/s

Min *****cm/s

HR *****BPM

You see the noise before place the probe and finding a suitable place and angle. This is not a real record.



Listening to the sound from the device speaker (a sound resembling a whip) can help you find a suitable place. Therefore, adjust the volume so that you can hear but not disturb other participants in the practice.

Probe1 Probe2

Decision

Compound

Separation

Return

Monitoring Screen

Numerical Data

Probe 8M

Mode Separation

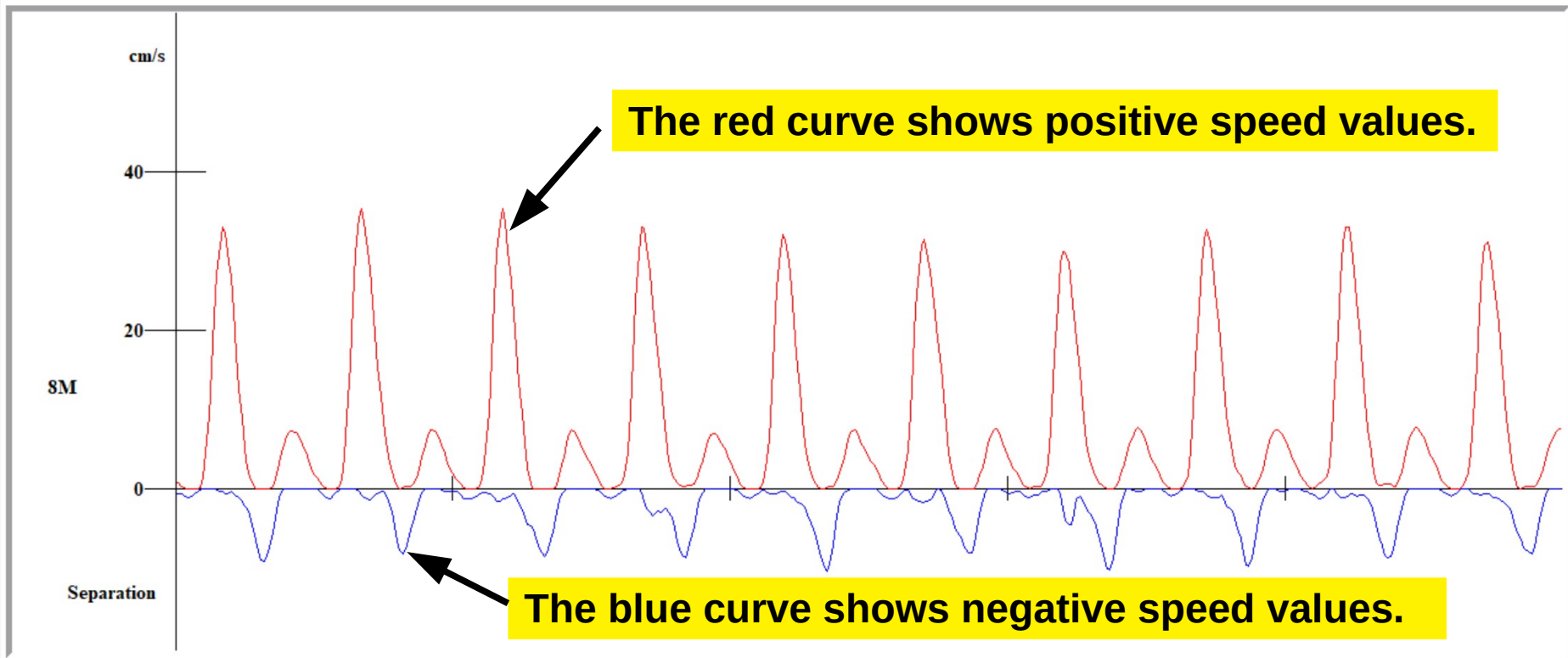
Max 34,32 cm/s

Ave. 7,69 cm/s

Min 0,00 cm/s

HR 118BPM

After finding the right place and the right angle, we see a periodically repeating course.



Probe1

Probe2

Decision

Compound

Separation

Return

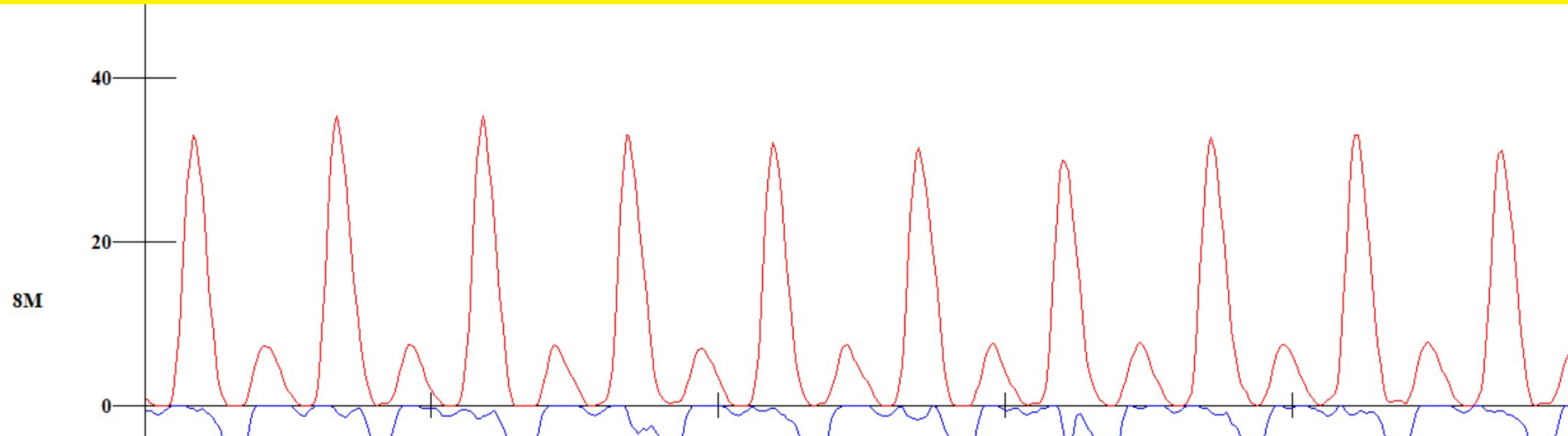
Monitoring Screen

Numerical Data

Probe 8M	Max	34,32 cm/s
Mode Separation	Ave.	7,69 cm/s
	Min	0,00 cm/s
	HR	118BPM

You need at least 5 complete periods for further analysis.

Click in the field with the graph or press the button on the probe to stop recording.



You must be careful to click in the field with the graph or press the button on the probe after stopping the recording, so that a new recording does not start, which would mean the loss of the current recording.

Probe1 Probe2

Decision

Compound

Separation

Return

Monitoring Screen

Numerical Data

Probe 8M

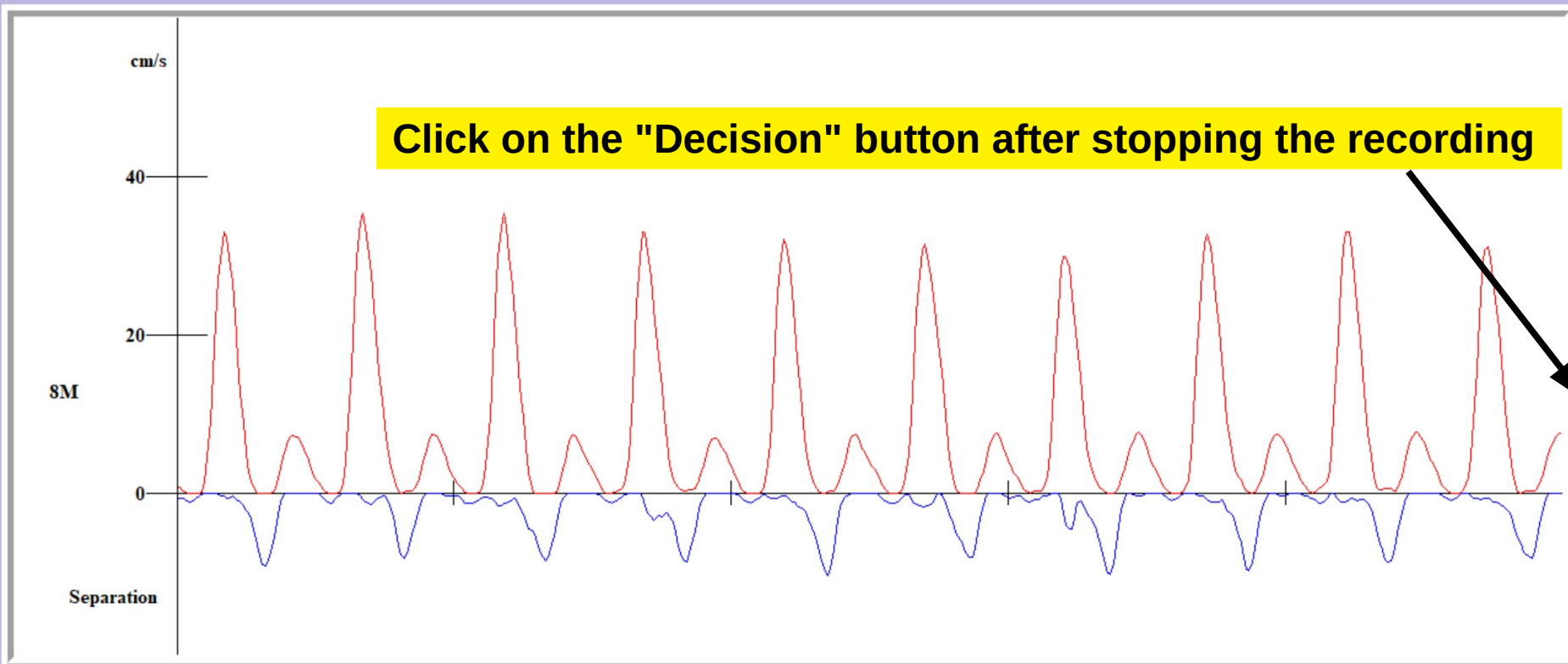
Mode Separation

Max 34,32 cm/s

Ave. 7,69 cm/s

Min 0,00 cm/s

HR 118BPM



Probe1	Probe2
Decision	
Compound	
Separation	
Return	

Individual Waveform

Numerical Data

Probe 8M

Mode Separation

Max 34,3 cm/s

Ave. 7,7 cm/s

D 0,0 cm/s

Min 0,0 cm/s

SD *****

RP 1,00

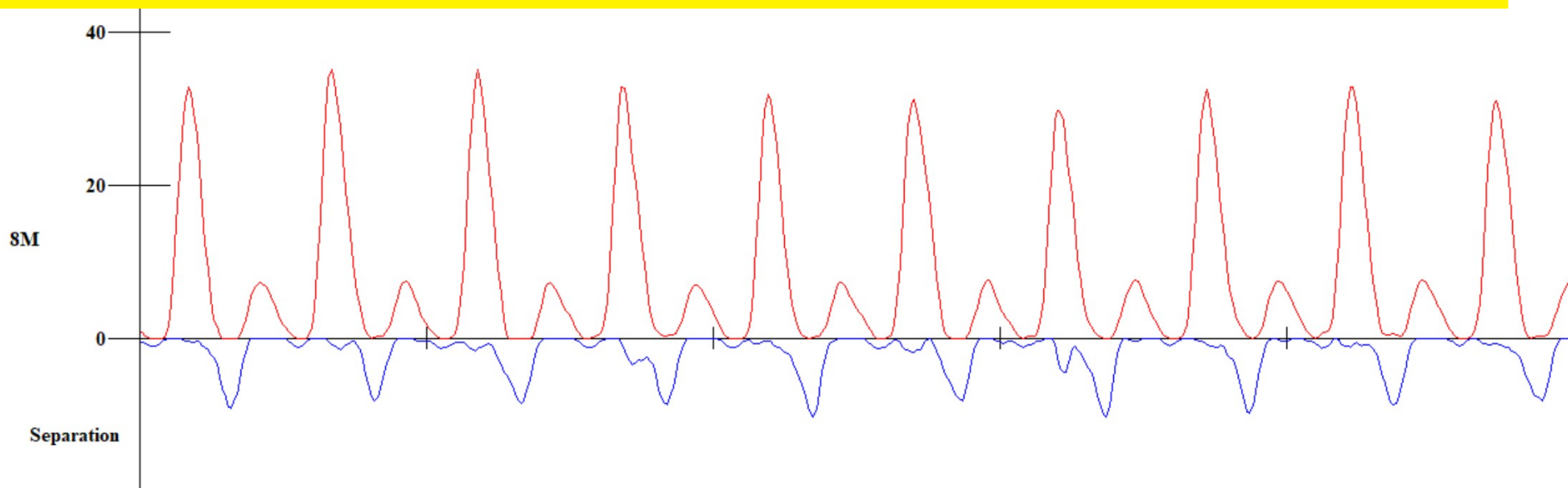
PI 4,45

HR 118BPM

Check that all automatic values have been calculated. If all automatic values have been calculated go to the next slide .

Pressure mmHg

Click in the box with the graph or press the button on the probe to start a new recording if not all automatic values have been calculated.



Site

Delete

Print

Compound

Separation

Return To
Main Screen

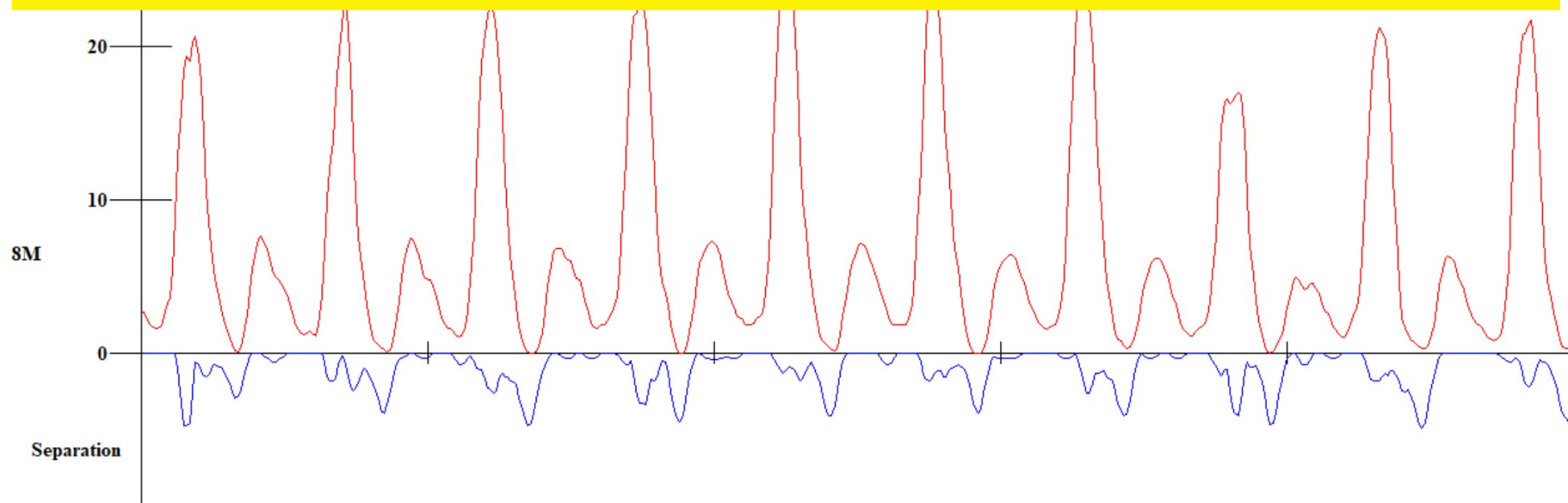
Individual Waveform

Numerical Data

Probe 8M	Max	22,2 cm/s	SD	17,08
Mode Separation	Ave.	6,4 cm/s	RP	0,94
	D	1,3 cm/s	PI	3,47
	Min	0,0 cm/s	HR	115 BPM

Pressure mmHg

Make a screenshot using the "PrtSc" key on the keyboard if all the automatic values have been calculated.



Site

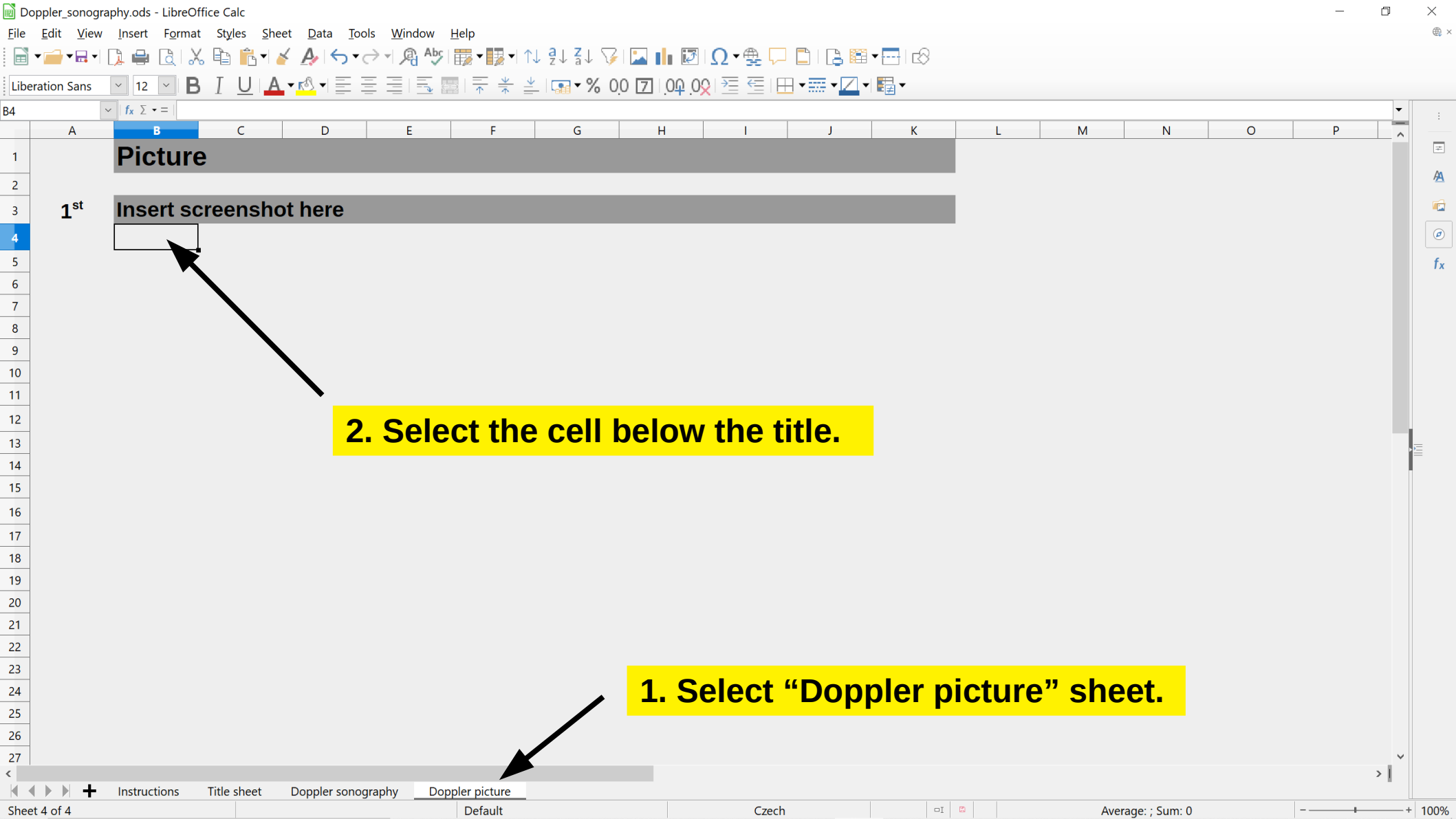
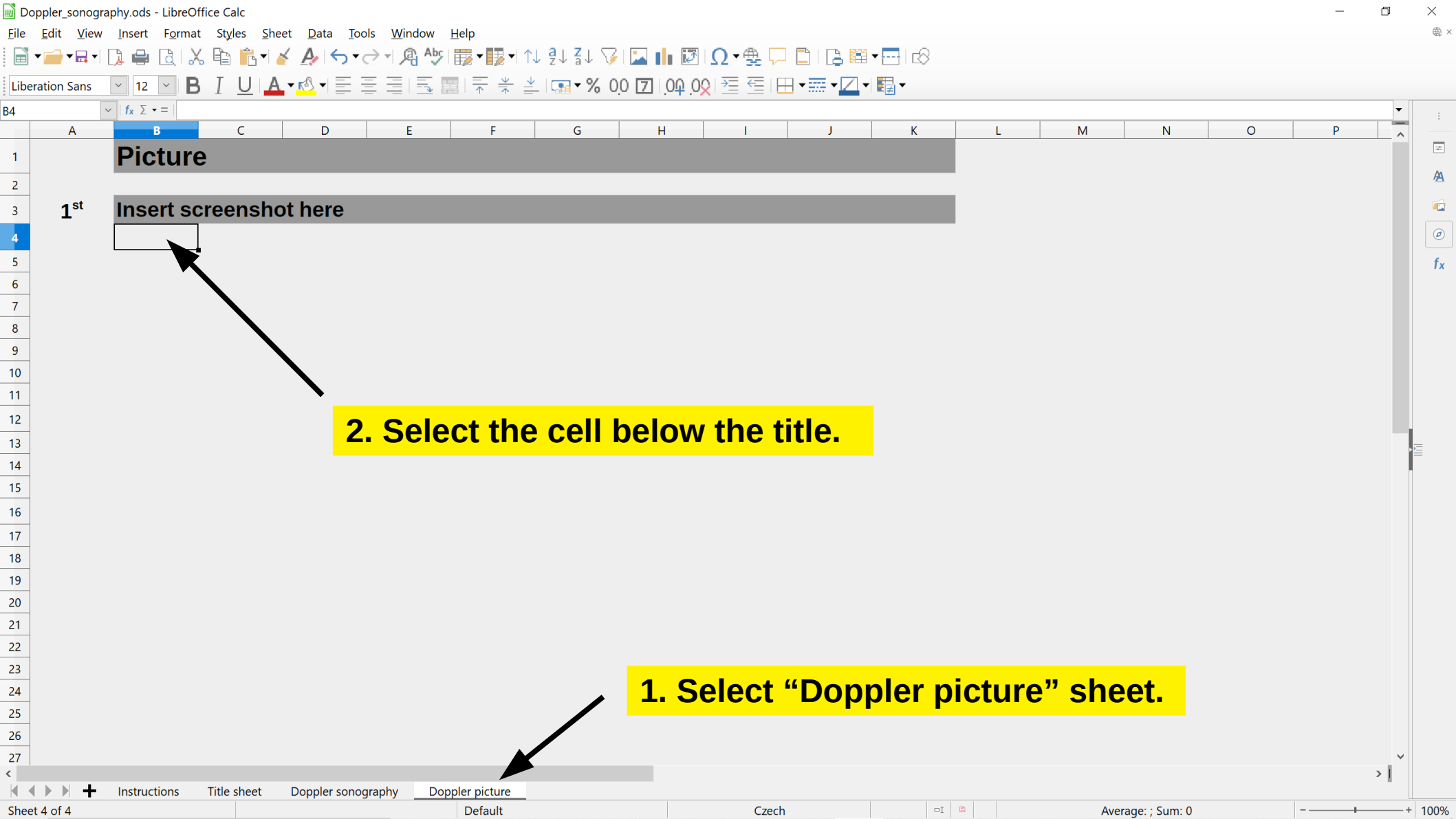
Delete

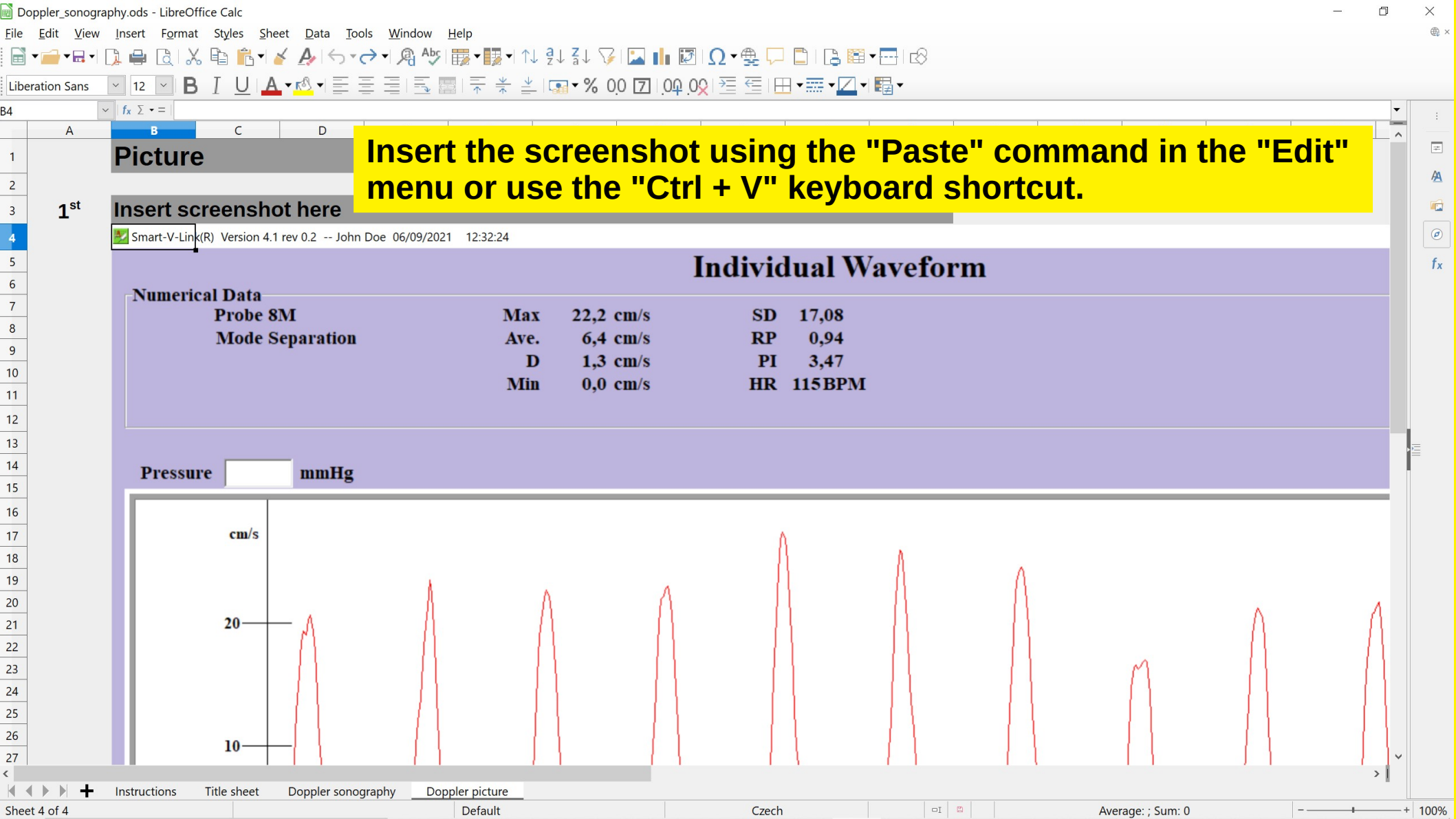
Print

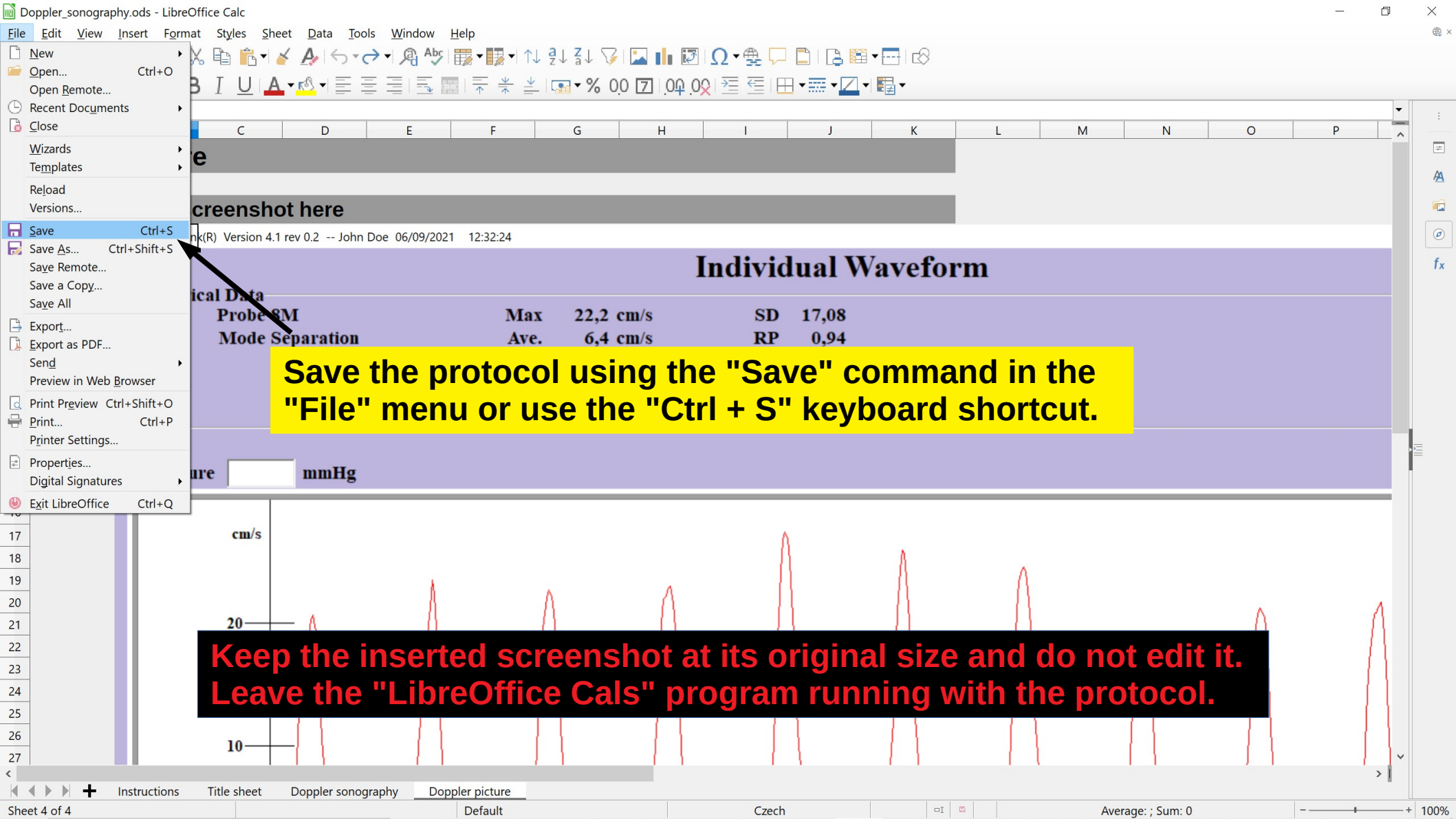
Compound

Separation

Return To
Main Screen

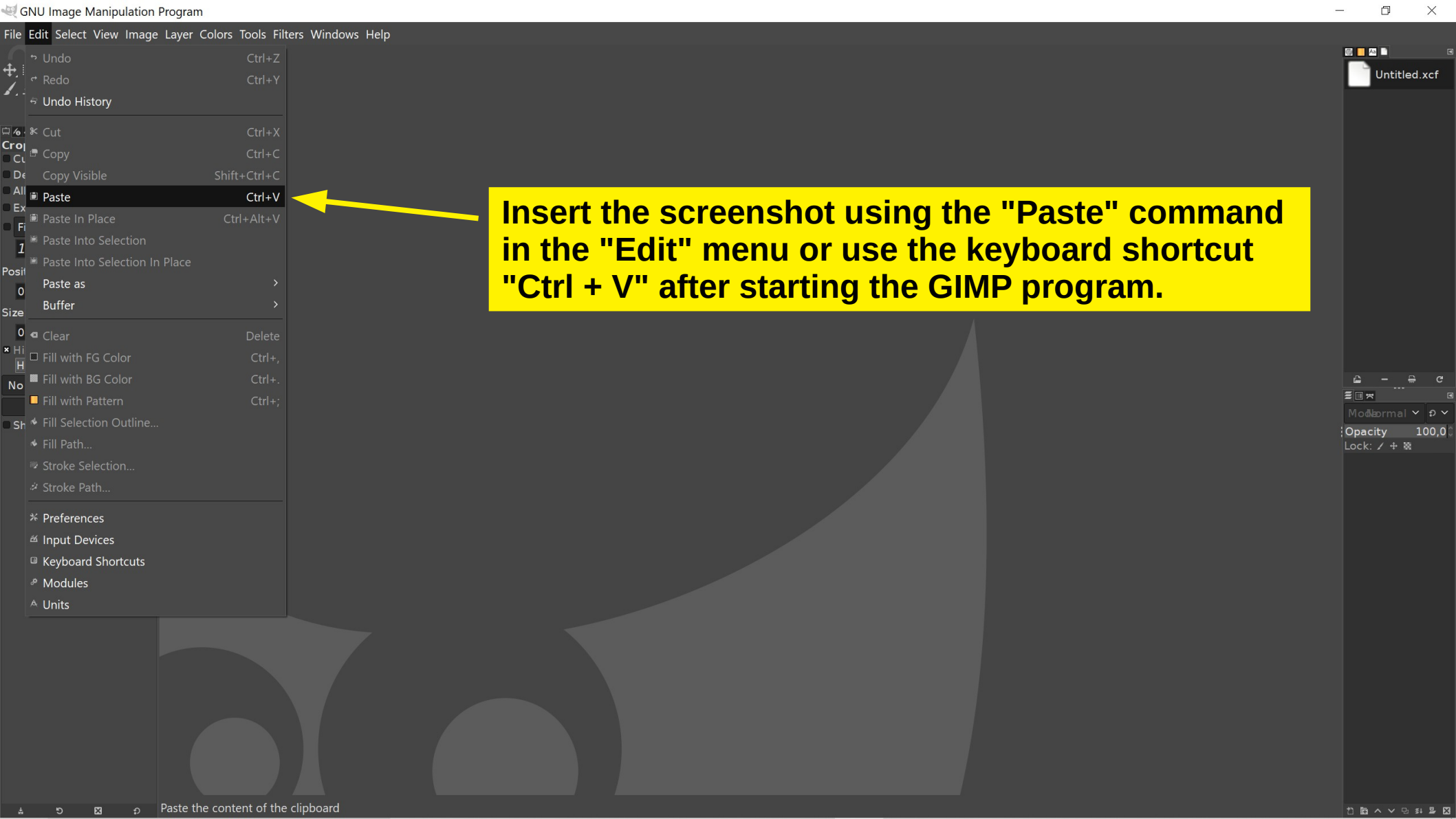




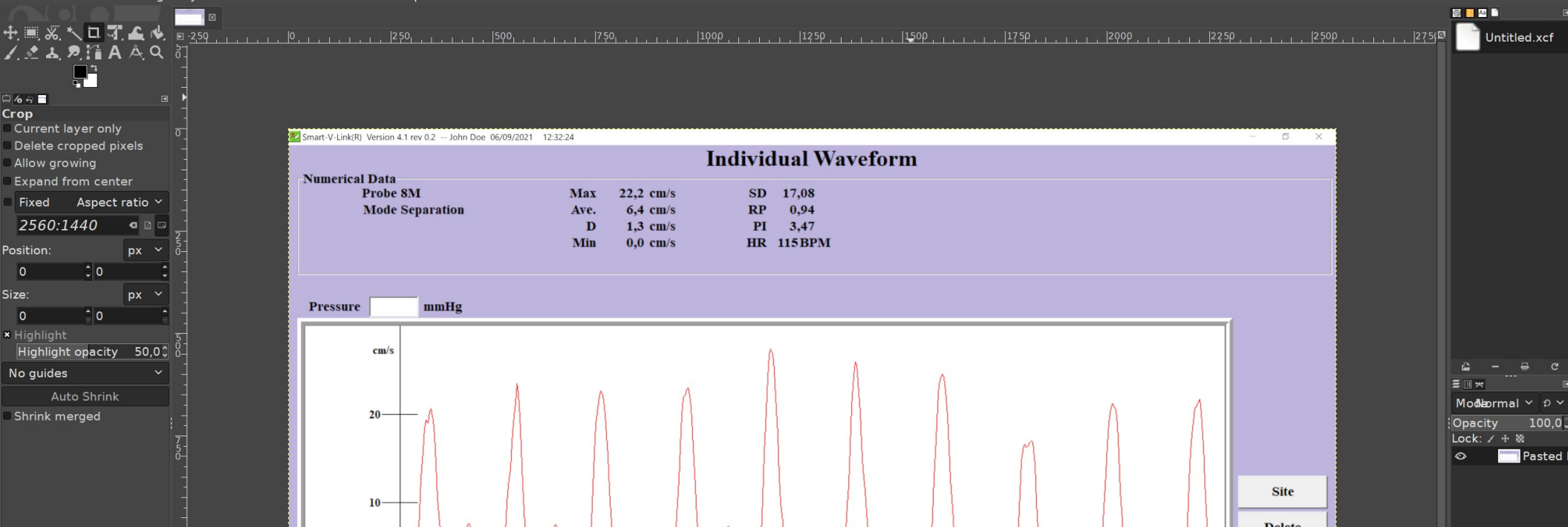




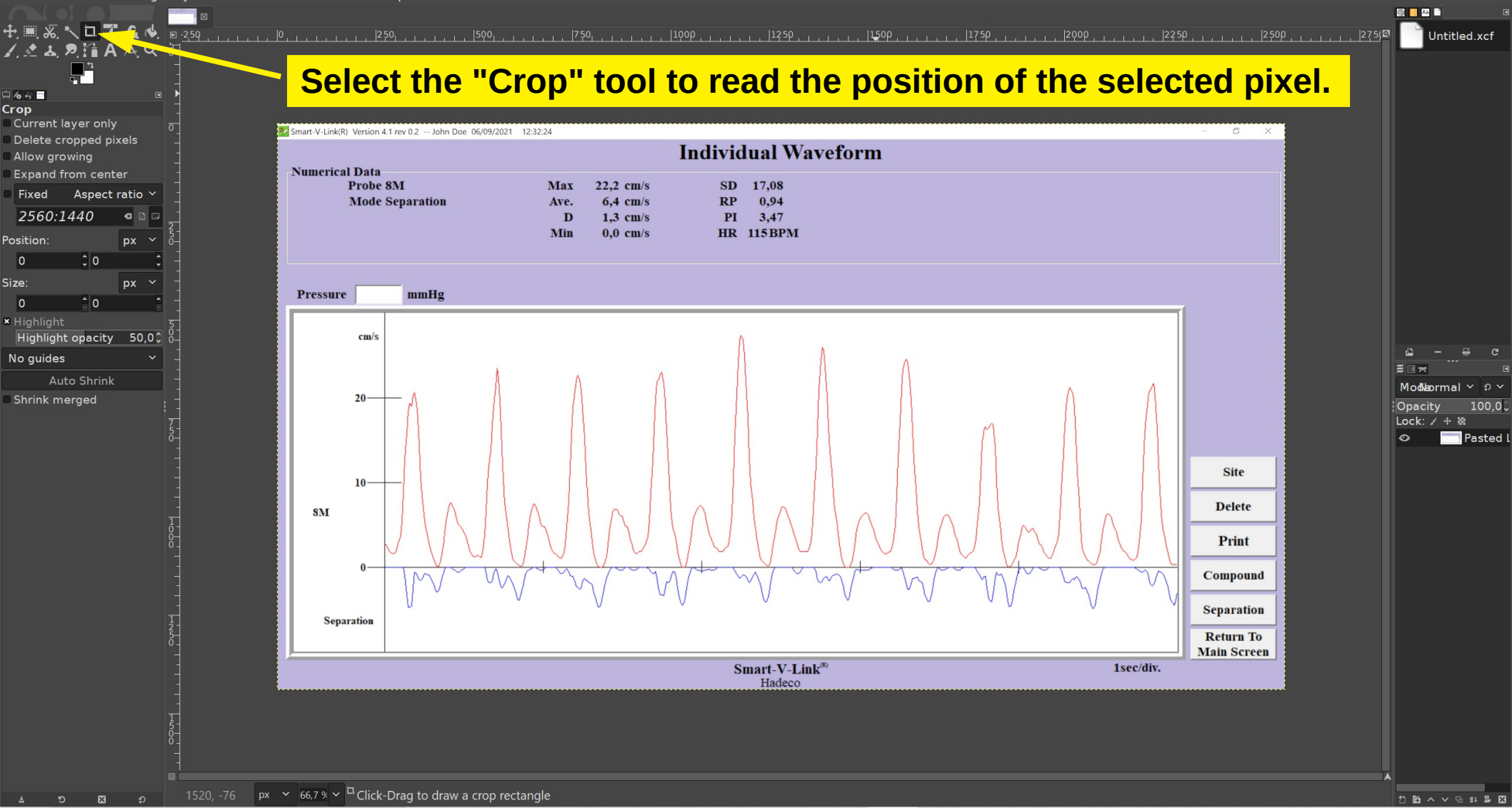
Click on the “GIMP” application icon.



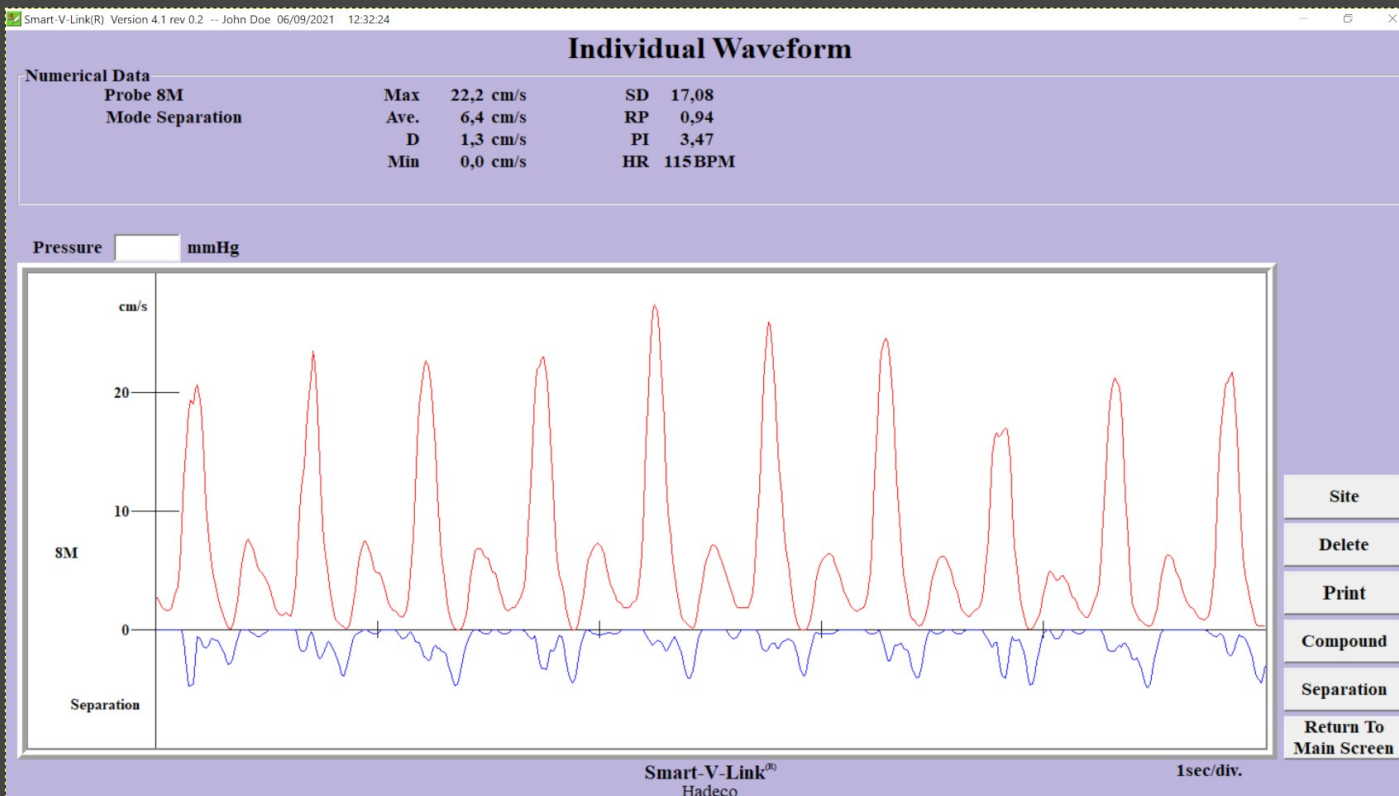
Insert the screenshot using the "Paste" command in the "Edit" menu or use the keyboard shortcut "Ctrl + V" after starting the GIMP program.



Keep the inserted screenshot at its original size and do not edit it. Leave the "GIMP" program running with the screenshot open. In further work, it is better to use a tiled arrangement of windows on the screen. This means that you have a protocol displayed on one half of the screen and a screenshot in the "GIMP" program on the other half. To get a tile layout, drag the window to the right or left edge of the screen. In this presentation, we will use full screen display for better clarity.



Select the "Crop" tool to read the position of the selected pixel.



Crop

- Current layer only
- Delete cropped pixels
- Allow growing
- Expand from center

Fixed Aspect ratio

2560:1440

Position: px

272 1130

Size: px

0 0

Highlight

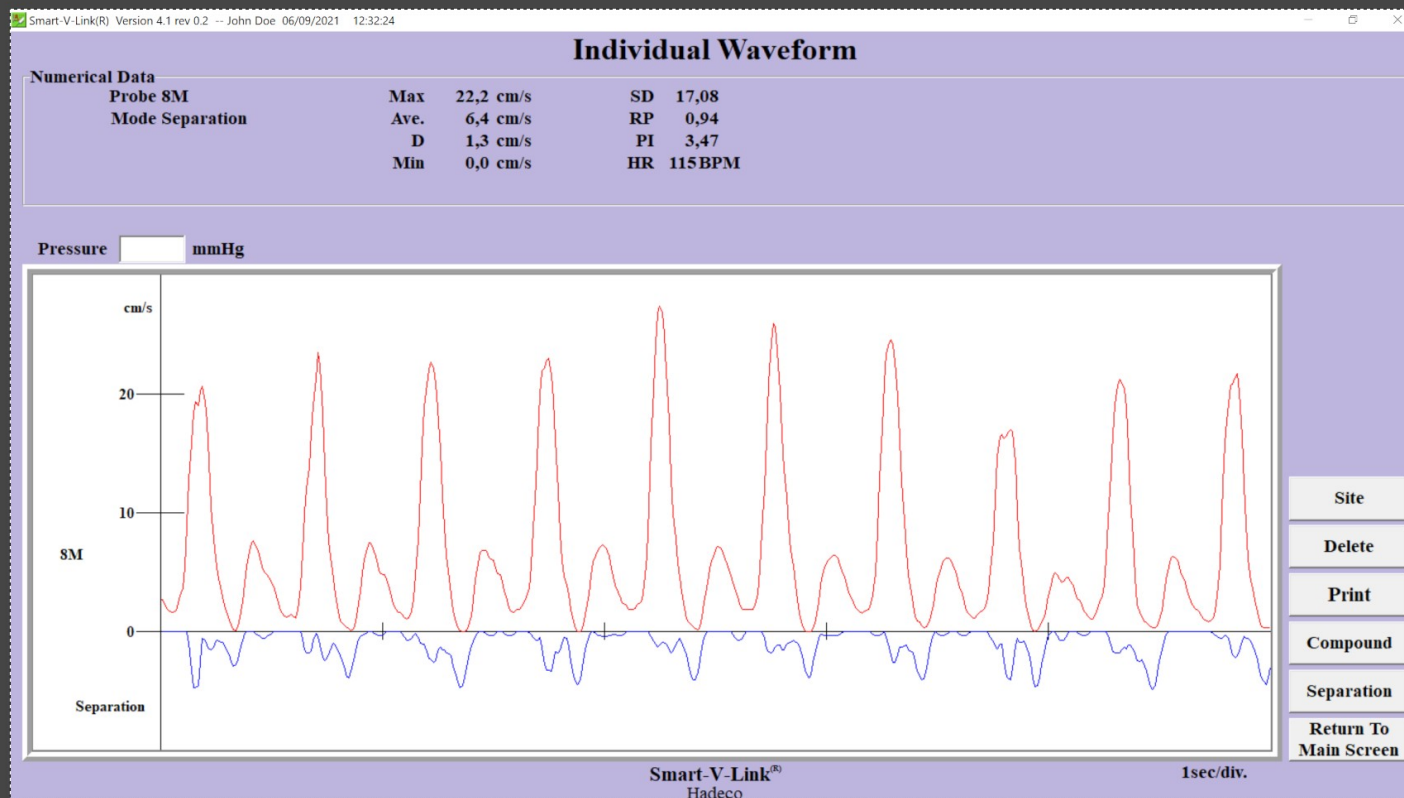
Highlight opacity 50,0

No guides

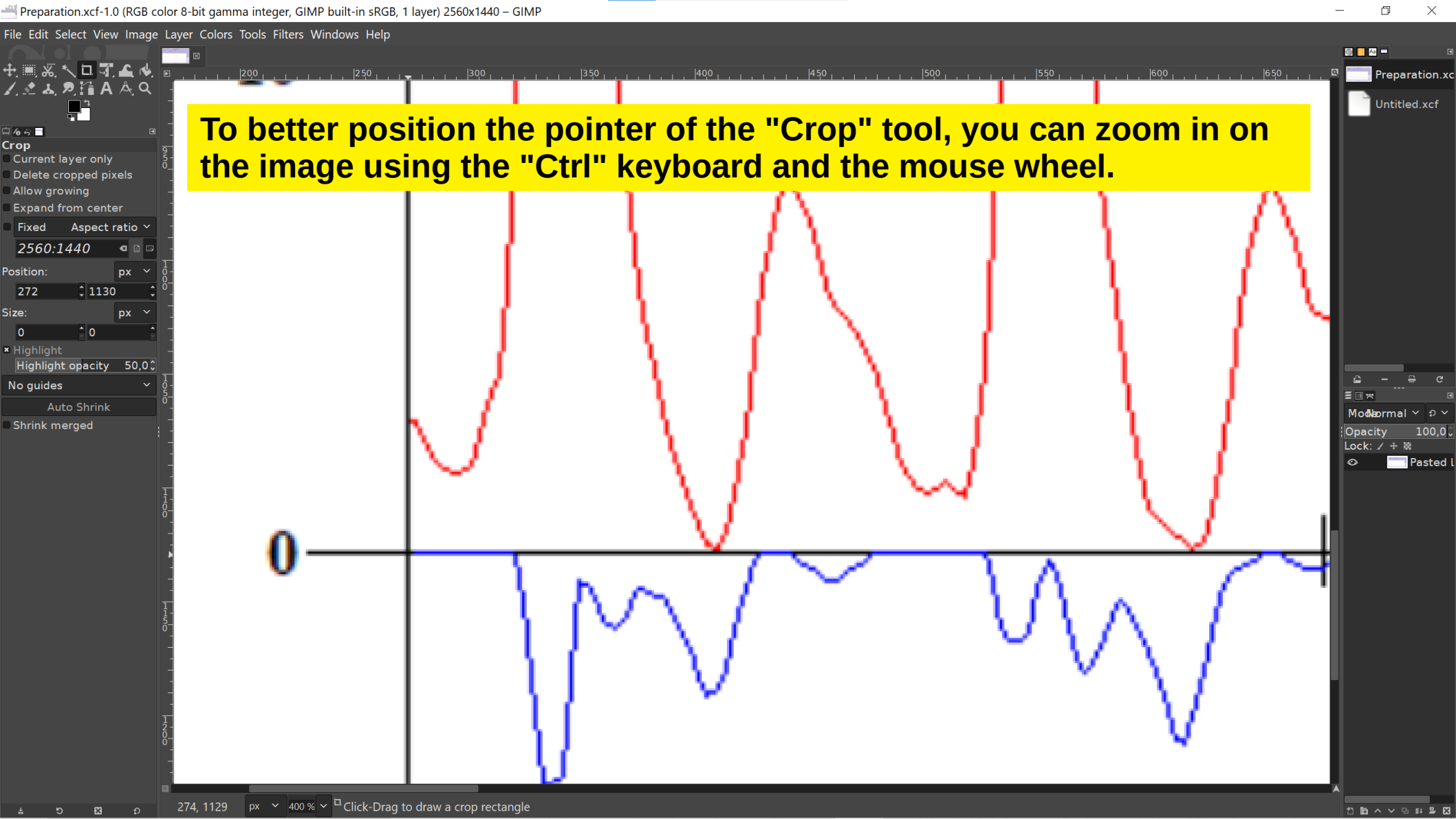
Auto Shrink

Shrink merged

The desired pixel position is displayed in the "Position:" fields after clicking on the selected pixel with the left mouse button.



The first value shows the x coordinate and the second shows the y coordinate.



To better position the pointer of the "Crop" tool, you can zoom in on the image using the "Ctrl" keyboard and the mouse wheel.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

2

6	Position of the 4s on x-axis	[pix]
---	------------------------------	-------

8	Position of selected value on y-axis	[pix]

11	Scale of y-axis	0.0	[pix/(cm/s)]
----	-----------------	-----	--------------

13 2nd Values calculation

15	1 st	2 nd	3 rd	4 th	5 th
----	-----------------	-----------------	-----------------	-----------------	-----------------

[illegible][illegible]

21 In the protocol, select the supplier s and the buyer b such that s is the

	Time (μ s)	0.0	0.00	0.00	0.00	0.00	[s]	
Begin of systoles								

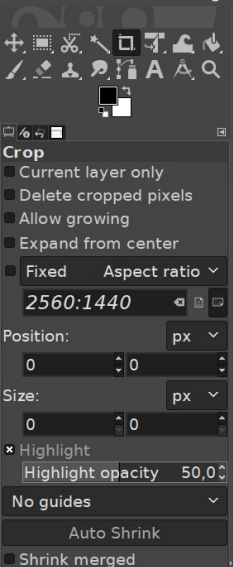
[illegible]

	Time (t_0)	0.00	0.00	0.00	0.00	0.00	[s]
End of systoles		0.0	0.0	0.0	0.0	0.0	

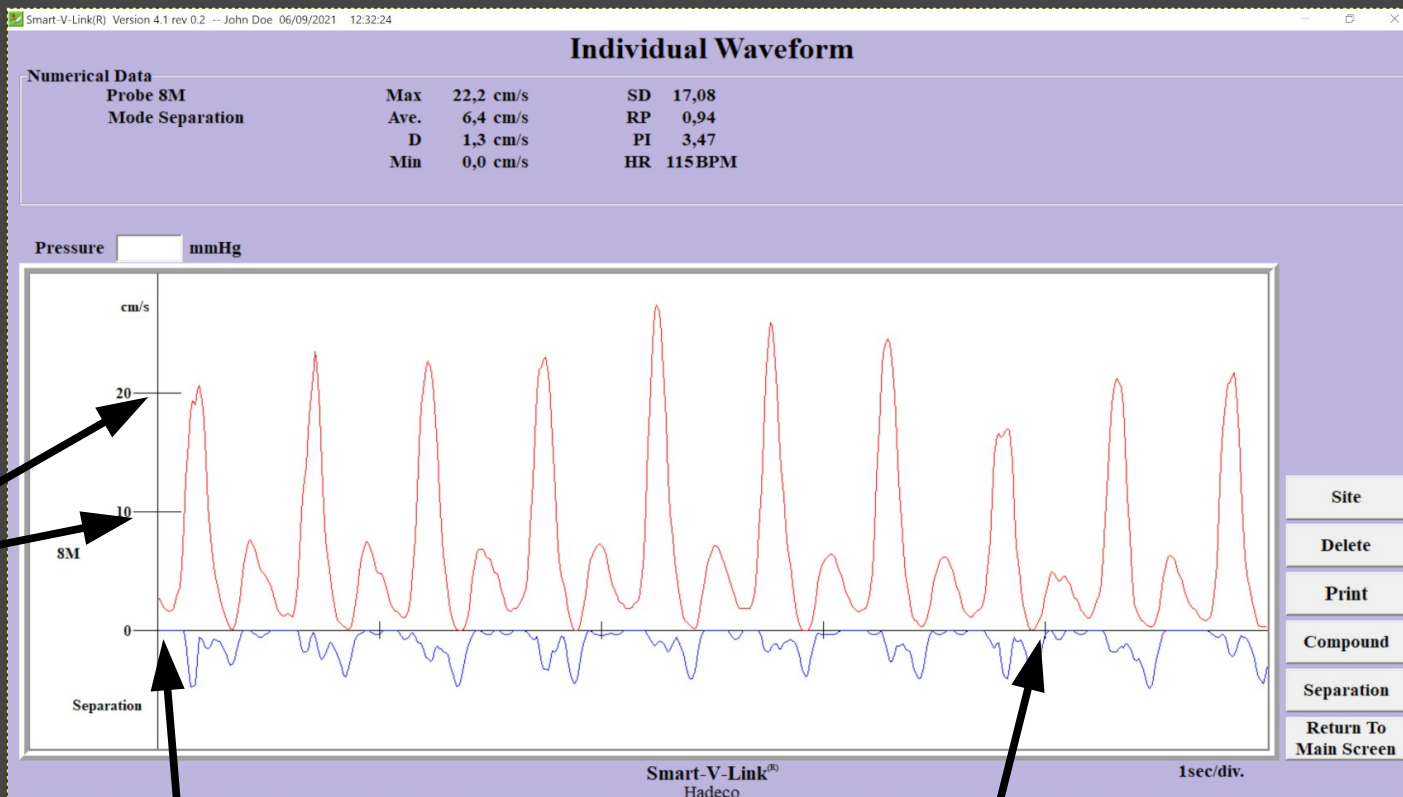
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Sheet 3 of 4 Default Czech Average: ; Sum: 0

Sheet 3 of 4 Default Czech Average: ; Sum: 0



Find the positions of the points for calibration.



Select a value on the y-axis

Position of the origin.

Position of the 4 seconds.



Doppler_sonography.ods - LibreOffice Calc

FileEditViewInsertFormatStylesSheetDataToolsWindowHelp

Liberation Sans12B I U A

% 0.00 0.00 0.00

M34fxΣ=0.94

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P		
13	2nd	Values calculation																
14																		
15						1 st	2 nd	3 rd	4 th	5 th								
16		Begin of systoles	x			296	520	720	915	1127								
17			y			1094	1103	1104	1093	1087								
18		Top of systoles				349	560	763	978	1180								
19			x			689	623	643	634	542								
20		End of systoles	x			520	720	915	1127	1347								
21			y			1103	1104	1093	1087	1089								
22		Time (t ₀)				0.06	0.61	1.11	1.60	2.12								
23		Begin of systoles	Velocity (D ₀)			1.6	1.2	1.1	1.6	1.9	1.48							
24		Top of systoles	Time (t _S)			0.19	0.71	1.22	1.75	2.25								
25																		
26	Subtract at the "GIMP" program the values for the five selected complete period and fill in.																	
27																		
28																		
29		Acceleration time	AT = t _S - t ₀			0.13	0.10	0.11	0.16	0.13	0.13							
30		Velocity acceleration	S-D ₀			18,8	22,3	21,4	21,3	25,3	21.86							
31		Velocity difference	S-D			19,3	22,4	20,9	21,1	25,4	21.81							
32		Heart rate	HR = 60/T			107,8	120,8	123,8	113,9	109,8	115.22							
33		S/D ration	S/D			17,6	21,0	13,9	12,0	15,0	15.91							
34		Resistance index	RI = (S-D)/S			0,9	1,0	0,9	0,9	0,9	0.93							
35		Acceleration index	AI = (S-D ₀)/AT			143	225	201	136	193	179							
36																		
37	3rd	Discussion																
38		Write down the automatically calculated index values from the screenshot.																
39																		

Sheet 3 of 4

InstructionsTitle sheetDoppler sonographyDoppler picture

CzechDefault

Average: 0.94; Sum: 0.94

100%

36	
37	3rd Discussion
38	
39	
40	
41	4th Conclusion
42	
43	

Fill in the "Discussion" and "Conclusion" fields.



The end